Claims

1. Method for analysis of the pressure variation in a perfusion device including multiple perfusion modules each equipped with a pump to deliver a liquid to be perfused in a line placed downstream from the pump as well as with means for measuring the pressure in the line, with junction points enabling connection of certain lines among each other or certain lines with lines from units external to the perfusion device, **wherein**, when a pressure variation Pk in a line k is detected, an analytical process is used to determine an involvement of other modules j in this pressure variation.

2. Method according to claim 1, **wherein** the analytical process includes a search for data indicating a modification of flow rate in another module j.

3. Method according to claim 2, **wherein** when a message indicating a modification of flow rate in another module j has been found, parameters for analysis of the module k are modified at least as long as the modification of the flow rate in the module j lasts.

4. Method according to claim 1, **wherein** the analytical process includes a comparison of a slope of a pressure curve of each line i with a slope of a pressure curve of a line k to determine lines j which are potentially connected to the line k by a junction point and which may also be affected by a pressure variation.

5. Method according to claim 2, **wherein** the analytical process includes a comparison of a slope of a pressure curve of each line i with a slope of a pressure curve of a line k to determine lines j which are potentially connected to the line k by a junction point and which may also be affected by a pressure variation.

6. Method according to claim 3, **wherein** the analytical process includes a comparison of a slope of a pressure curve of each line i with a slope of a pressure curve of a line k to determine lines j which are potentially connected to the line k by a junction point and which may also be affected by a pressure variation.

7. Method according to claim 1, **wherein** the analytical process includes a comparison of a rate of pressure increase in a line k with a theoretical rate that it should have if an obstruction developed in the line upstream from any junction point with another line.

8. Method according to claim 2, **wherein** the analytical process includes a comparison of a rate of pressure increase in a line k with a theoretical rate that it should have if an obstruction developed in the line upstream from any junction point with another line.

9. Method according to claim 3, **wherein** the analytical process includes a comparison of a rate of pressure increase in a line k with a theoretical rate that it should have if an obstruction developed in the line upstream from any junction point with another line.

10. Method according to claim 4, **wherein** the analytical process includes a comparison of a rate of pressure increase in a line k with a theoretical rate that it should have if an obstruction developed in the line upstream from any junction point with another line.

11. Method according to claim 5, **wherein** the analytical process includes a comparison of a rate of pressure increase in a line k with a theoretical rate that it should have if an obstruction developed in the line upstream from any junction point with another line.

12. Method according to claim 6, **wherein** the analytical process includes a comparison of a rate of pressure increase in a line k with a theoretical rate that it should have if an obstruction developed in the line upstream from any junction point with another line.

13. Method according to claim 10, **wherein** the analytical process includes a calculation of a theoretical rate of pressure increase which should be observed in the line k in the event of an obstruction downstream from junction points with the lines j and a comparison of the rate of pressure increase in the line k with this theoretical rate.

14. Method according to claim 11, **wherein** the analytical process includes a calculation of a theoretical rate of pressure increase which should be observed in the line k in the event of an obstruction downstream from junction points with the lines j and a comparison of the rate of pressure increase in the line k with this theoretical rate.

15. Method according to claim 12, **wherein** the analytical process includes a calculation of a theoretical rate of pressure increase which should be observed in the line k in the event of an obstruction downstream from junction points with the lines j and a comparison of the rate of pressure increase in the line k with this theoretical rate.

16. Method according to claim 1, **wherein** a pressure Pi in each line i is measured at regular intervals, and measurements are stored in a history file starting at the latest at a time when a pressure variation is detected in a line k.

17. Method according to claim 1, **wherein** the analytical process is initiated when a pressure Pk in a line k reaches a threshold value established for each pump.

18. Method according to claim 7, **wherein** when the results of the analytical process lead to a conclusion that a rupture or an obstruction has developed downstream from a pump k, the pump k is stopped.

19. Method according to claim 18, **wherein** pumps j connected to the pump k by their respective lines at junction points located upstream from a rupture or the obstruction are also stopped.

20. Method according to claim 18, **wherein**, when an obstruction is detected, each pump j which has been stopped is operated in reverse for a period of time Δtj, at a reverse flow rate RQj proportional to the initial flow rate Qj at a time of normal operation.

21. Method according to claim 20, **wherein** the periods of time Δtj during which the pumps affected by the obstruction operate in reverse at the reverse flow rate RQj are selected identical for all said pumps and equal

$$\Delta t = (T2\text{-}T0) \times \Sigma\ (Qj) / \Sigma\ (RQj),$$

where T0 is a time at which the obstruction occurred, this time T0 being determined by means of a history of measurements recorded from a beginning of the perfusion, and T2 is a time at which the pump k and possibly the pumps j were stopped.

22. Method according to claim 20, **wherein** each pump j affected operates in reverse until a pressure determined on its line j has dropped below an established threshold Plj.

23. Method according to claim 1, **wherein** a result of the analytical process is displayed in form of a connection diagram of the various lines.

24. Perfusion device including multiple perfusion modules each equipped with a pump to deliver a liquid to be perfused in a line placed downstream from the pump as well as means for measuring the pressure in the line, with junction points enabling connection of certain lines among each other or certain lines with lines from units external to the perfusion device, the modules being capable of exchanging data among each other or with a base unit, **wherein** the perfusion device is equipped with a device implementing the method according to claim 1.